1035-81-1186 **Trond Digernes**, **V. S. Varadarajan** and **David E. Weisbart*** (dweisbart@gmail.com). *Path Integral Representations for the Propagators Associated to Schrödinger Operators on Local Fields.*

Recent studies have discussed the convergence of discrete quantum systems to a continuous analog. These studies lead us to consider the possibility that the real model is an idealization of a mathematically richer model that has arithmetical features. Given a local field K, it is possible to formulate quantum theory over K^n where n is a natural number and where time is still given to be real. The quantum Hilbert space is taken to be a space with complex coefficients and we include in our model particles with internal symmetry. The Hamiltonian operator, H, is a pseudo-differential operator. For a wide class of potentials, H is self-adjoint and there is a path integral representation for the associated dynamical semi-group. There is an interesting difference between this Feynman-Kac formula and the usual one. The path integral in the local field setting turns out to be an integral over the Skorokhod space of paths, $D[0,t]$, with respect to a measure determined by the free part of the Hamiltonian. As in the case of a real configuration space, it is possible to prove the Feynman-Kac formula in this local field setting relying only on the Yosida-Hille theory of semi-groups. (Received September 19, 2007)